

**AERONAUTICAL CHARTING FORUM**  
**Instrument Procedures Group**  
**Meeting 15-02 October 27, 2015**

**RECOMMENDATION DOCUMENT**

**FAA Control # 15-02-323**

**Subject: Depiction of Low, Close-in Obstacles on SIDs & ODPS**

**Background/Discussion:**

Beginning with the publication of FAA Order 8260.46, Departure Procedures, and consistent with subsequent revisions, FAA policy has been to depict the location and height of low, close-in obstacles identified in FAA Order 8260.3B, Vol 4, paragraph, 1.3.1 Low, Close-In OCS Penetrations. These obstacles require a higher than standard climb gradient, but to a height not exceeding 200' above Departure End of Runway (DER) elevation. Further, these obstacles do not force the promulgation of higher than standard takeoff minimums enabling "see and avoid" procedures (ref: FAA Order 8260.46E, Table 2-1-1, Situation 2).

While well-intentioned, the publication of these low, close-in obstacle notes has resulted in a serious chart clutter issue on many Standard Instrument Departures (SIDs) and extensively long Takeoff Minimums & Obstacle Departure Procedures (ODP) entries on those runways with numerous close-in obstacles.

Section 5-2-8 of the Aeronautical Information Manual (AIM) furnishes the following guidance to pilots concerning low, close-in obstacles:

4. Obstacles that are located within 1 NM of the DER and penetrate the 40:1 OCS are referred to as "low, close-in obstacles." The standard required obstacle clearance (ROC) of 48 feet per NM to clear these obstacles would require a climb gradient greater than 200 feet per NM for a very short distance, only until the aircraft was 200 feet above the DER. To eliminate publishing an excessive climb gradient, the obstacle AGL/MSL height and location relative to the DER is noted in the "Take-off Minimums and (OBSTACLE) Departure Procedures" section of a given Terminal Procedures Publication (TPP) booklet. The purpose of this note is to identify the obstacle(s) and alert the pilot to the height and location of the obstacle(s) so they can be avoided. This can be accomplished in a variety of ways, e.g., the pilot may be able to see the obstruction and maneuver around the obstacle(s) if necessary; early liftoff/climb performance may allow the aircraft to cross well above the obstacle(s); or if the obstacle(s) cannot be visually acquired during departure, preflight planning should take into account what turns or other maneuver may be necessary immediately after takeoff to avoid the obstruction(s).

As stated in Order 8260.3B, these obstacles do not force higher than standard takeoff minimums. Therefore, it is questionable whether a pilot can actually see and avoid these obstacles immediately after takeoff, especially for certificated operators who may be departing using lower than standard takeoff minimums approved through OpSpecs.

Further, the AIM states that IFR departure procedures are “*based on the pilot crossing the departure end of the runway at least 35 feet above the departure end of runway elevation, climbing to 400 feet above the departure end of runway elevation before making the initial turn*” (ref: AIM 5-2-8 b1). Pilots might interpret the FAA’s guidance to consider “turns or other maneuvers” at low altitude (i.e., less than 400 feet above the DER) immediately after takeoff in marginal VMC or even IMC to avoid these obstacles, is—contrary to the concept of no turn until reaching 400 feet above the runway, which is not what was intended and could be a safety risk if done so. The preferred option is for the pilot to plan to the initial takeoff climb performance to vertically clear any low, close-in obstacle(s) while complying with the recommendations against turns below 400 feet AGL.

An additional concern is that the publication of multiple low, close-in obstacles masks the presence of those obstacles that must also be published as result of the establishment of higher-than-standard takeoff minimums in lieu of complying with the published climb gradient for the departure. When higher than standard takeoff minimums are published as an option for use instead of applying the higher than standard climb gradient (FAAO 8260.46E, Table 2-1-1, Situation 3 or Situation 4), the obstacle(s) necessitating the higher takeoff minimums must be published. However, these obstacles(s) are often lost in the sea of low, close-in obstacle. These are obstacles that the pilot must “see and avoid” during the takeoff if they are unable to comply with the climb gradient.

### **Recommendations:**

NBAA, with the support of other Industry partners, recommends that Order 8260.46 be amended to remove the requirement to publish the location of each individual or group of low, close in obstacles on SIDs and ODPs. In place of this requirement, we recommend that the “Takeoff Obstacle Notes” sections for the applicable 8260 Forms be changed to publish when low, close-in obstacles that are identified for a departure runway, document the existence of these obstacles along with the height of highest of these obstacles and the distance of the closest obstacle from the DER, as shown below:

**Rwy 13, Low, close in obstacles beginning 1654' from DER, up to 61'AGL/1078' MSL.**

Figure 1 depicts the current ODP entry for St. Cloud MN (STC) and the proposed change to the depiction of low, close-in obstacles. Figures 2a and 2b depict the current MOONY3 SID at San Jose, CA (SJC) and this chart with the proposed change.

In addition to reducing the complexity of the obstacle notes, attention is drawn to the obstacle(s) that must be visually avoided when using the higher than standard takeoff minimums in lieu of a higher than standard climb gradient (obstacle highlighted in red on the STC example – for reference in this document only - we are not suggesting red be used for publication). The revised note regarding low, close-in obstacles still furnishes the pilot with sufficient information for planning purposes to aid the pilot in vertically avoiding these obstacles.

No IACC changes are required to implement this recommendation.

If this recommendation is adopted, a revision to AIM, section 5-2-8, is also necessary to call attention to the change in the depiction of low-close-in obstacles and to emphasize that any obstacle that is specifically listed by type on the SID or ODP must be visually avoided if the pilot departs IFR using the higher than standard takeoff minimums. See Figure 3 for our recommended changes to the AIM. In addition, it is recommended that this change, if adopted, be thoroughly discussed in the next edition of the FAA Instrument Procedures Handbook and Instrument Flying Handbook.

NBAA believes that these changes will reduce clutter on SIDs and ODPS and call attention to the more critical obstacles, ones that must be seen and avoided using the higher than standard takeoff minimums.

**Comments:**

This recommendation affects the following:

1. FAA Order 8260-46, Departure Procedures
2. Aeronautical Information Manual 5-2-8
3. FAA-H-8083-3A, Instrument Flying Handbook
4. FAA-H-8261-1A, Instrument Procedures Handbook

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Figure 1

**St. Cloud, MN Takeoff Minimums & ODP – CURRENT:**

ST. CLOUD, MN

ST. CLOUD RGNL (STC)

TAKEOFF MINIMUMS AND (OBSTACLE)

DEPARTURE PROCEDURES

ORIG 09239 (FAA)

TAKEOFF MINIMUMS: **Rwy 5**, 300-1½ or std. w/ min. climb of 201' per NM to 1300 or alternatively, with standard TAKEOFF minimums and a normal 200'/NM climb gradient, TAKEOFF must occur no later than 1100' prior to DER.

NOTE: **Rwy 5**, tower 6201' from DER, 1416' left of centerline, 149' AGL/1179' MSL. Multiple trees beginning 17' from DER, 373' right of centerline, up to 59' AGL/1081' MSL. Multiple trees beginning 1752' from DER, 56' left of centerline, up to 80' AGL/1102' MSL.

**Rwy 13**, tree 1654' from DER, 884' right of centerline, 61' AGL/1078' MSL. Tree 1265' from DER, 794' left of centerline, 42' AGL/1059' MSL. **Rwy 23**, trees 2109' from DER, 29' right of centerline, up to 61' AGL/1082' MSL. Trees 1725' from DER, 93' left of centerline, up to 55' AGL/1076' MSL. Fence 74' from DER, 216' left of centerline, 2' AGL, 1023' MSL. **Rwy 31**, terrain beginning 29' from DER, 50' right of centerline, up to 1083' MSL. Terrain beginning 107' from DER, 7' left of centerline, up to 1060' MSL.

**St. Cloud, MN Takeoff Minimums & ODP – PROPOSED:**

ST. CLOUD, MN

ST. CLOUD RGNL (STC)

TAKEOFF MINIMUMS AND (OBSTACLE)

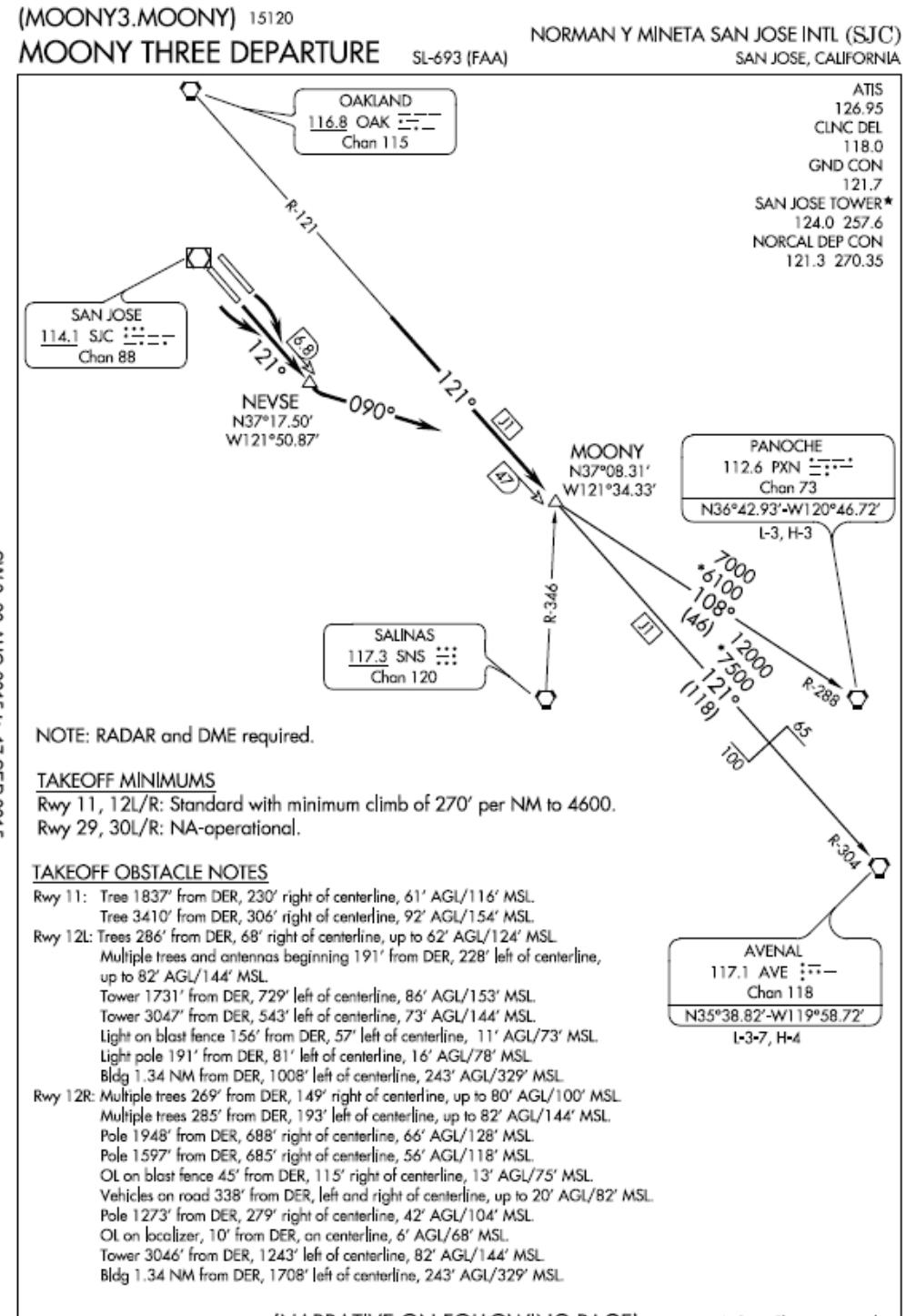
DEPARTURE PROCEDURES

ORIG 09239 (FAA)

TAKEOFF MINIMUMS: **Rwy 5**, 300-1½ or std. w/ min. climb of 201' per NM to 1300 or alternatively, with standard TAKEOFF minimums and a normal 200'/NM climb gradient, TAKEOFF must occur no later than 1100' prior to DER.

NOTE: **Rwy 5**, Low, close in obstacles beginning 17' from DER up to 80' AGL/1102' MSL. Tower 6201' from DER, 1416' left of centerline, 149' AGL/1179' MSL. **Rwy 13**, Low, close in obstacles beginning 1654' from DER, up to 61'AGL/1078' MSL. **Rwy 23**, Low, close in obstacles 74' from DER, up to 61' AGL/1082' MSL. **Rwy 31**, Low, close in obstacles beginning 29' from DER, up to 1083' MSL.

Figure 2a – MOONY3 SID SJC – Current:



MOONY THREE DEPARTURE  
(MOONY3.MOONY) 15120

SAN JOSE, CALIFORNIA  
NORMAN Y MINETA SAN JOSE INTL (SJC)

Figure 2b – MOONY3 SID SJC – Incorporating Proposed Change:

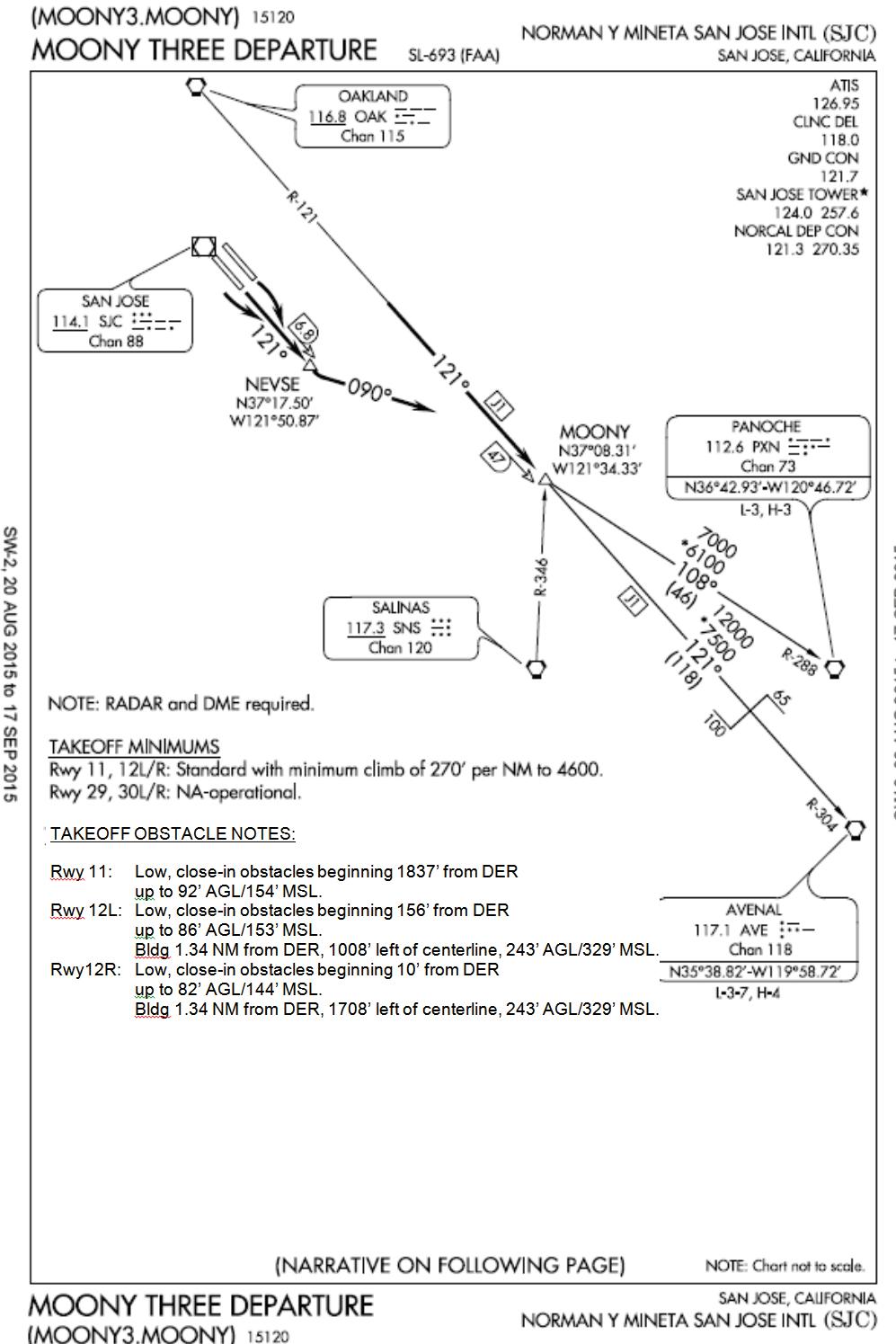


Figure 3 – Revised AIM 5-2-8 Guidance:

**5-2-8. Instrument Departure Procedures  
(DP) – Obstacle Departure Procedures  
(ODP) and Standard Instrument Departures  
(SID)**

4. Obstacles that are located within 1 NM of the DER and penetrate the 40:1 OCS are referred to as “low, close-in obstacles.” The standard required obstacle clearance (ROC) of 48 feet per NM to clear these obstacles would require a climb gradient greater than 200 feet per NM for a very short distance, only until the aircraft was 200 feet above the DER. In addition, these obstacles do not warrant the establishment of higher-than-standard takeoff minimums for that runway.

To eliminate publishing an excessive climb gradient, obstacle AGL/MSL height and location relative to the DER is Low, close in obstacles are noted in the “Take-off Minimums and (OBSTACLE) Departure Procedures” section of a given Terminal Procedures Publication (TPP) booklet. The purpose of this note is to identify the presence of these obstacle(s) and alert the pilot as to their general height and location. of the obstacle(s) so they can be avoided. This can be accomplished in a variety of ways, e.g., the pilot may be able to see the obstruction and maneuver around the obstacle(s) if necessary. may or if the obstacle(s) cannot be visually acquired during departure, preflight planning should take into account what turns or other maneuver may be necessary immediately after takeoff to avoid the obstruction(s).

Pilots should ensure that adequate performance exists that allows these obstacles to be cleared during the initial takeoff. This performance may be the result of additional height crossing the departure end of runway beyond the 35 feet expected crossing height, the result of sufficient climb performance, or a combination the two.

c. Who is responsible for obstacle clearance? DPs are designed so that adherence to the procedure by the pilot will ensure obstacle protection. Additionally:

1. Obstacle clearance responsibility also rests with the pilot when he/she chooses to climb in visual conditions in lieu of flying a DP and/or depart under increased takeoff minima rather than fly the climb gradient. Standard takeoff minima are one statute mile for aircraft having two engines or less and one-half statute mile for aircraft having more than two engines. Specified ceiling and visibility minima (VCOA or increased takeoff minima) will allow visual avoidance of obstacles until the pilot enters the standard obstacle protection area. Obstacles(s) that

must be visually avoided when using the higher than standard takeoff minimums are listed in the Take-off Minimums and (Obstacle) Departure Procedures section of the U. S. Terminal Procedure booklet. The MSL height of the obstacle and its height above the ground (AGL) at the obstacles' actual location is provided. Obstacle avoidance is not guaranteed if the pilot maneuvers farther from the airport than the specified visibility minimum prior to reaching the specified altitude. DPs may also contain what are called Low Close in Obstacles. These obstacles are less than 200 feet above the departure end of runway elevation and within one NM of the runway end, and do not require increased takeoff minimums. These obstacles are identified on the SID chart or in the Take-off Minimums and (Obstacle) Departure Procedures section of the U. S. Terminal Procedure booklet. These obstacles are especially critical to aircraft that do not lift off until close to the departure end of the runway or which climb at the minimum rate. Pilots should also consider drift following lift-off to ensure sufficient clearance from these obstacles. That segment of the procedure that requires the pilot to see and avoid obstacles ends when the aircraft crosses the specified point at the required altitude. In all cases continued obstacle clearance is based on having climbed a minimum of 200 feet per nautical mile to the specified point and then continuing to climb at least 200 foot per nautical mile during the departure until reaching the minimum enroute altitude, unless specified otherwise.

**INITIAL DISCUSSION – MEETING 15-02:** Rich Bell, NBAA, presented this issue with several industry partners supporting this position.  FAA policy since around 2000 is to publish low, close-in obstacles (LCIO) on SIDs & ODPs. An example was provided for Chicago's Midway Airport (MDW) Runway 31R. It was noted that not all obstacles in the Initial Climb Area (ICA) are listed since they can be grouped per criteria (i.e., highest/closest per grouping policy specified in Order 8260.46). One problem is that many locations have very long lists of obstacles and this can result in procedures being split into two pages (i.e., First page being the procedure graphic and the second page just for the list of obstacles). Not all obstacles are in the LCIO notes, with some penetrating the 40:1 surface to a height above 200ft, requiring a higher climb gradient/visibility restriction to see and avoid. The actual obstacle that you may need to avoid can be difficult to pick out of the list. Another issue is that new survey data being submitted is resulting in many more obstacles being identified, adding to an already extensive list of obstacles. The proposal is to change the LCIO obstacle notes section, when LCIOs are present, to identify the highest and closest obstacles to DER in the ICA for the pilot to be aware of. This change would have to be explained in the AIM and IPH. Obstacles that the pilot must be aware of that must be considered and avoided will still be listed and would be easier for the pilot to identify. There should be no charting or

TERPs criteria changes required, just the method used in stating these obstacles. Discussions followed on: turns in low visibility to avoid a LCIO; listing of the highest obstacle vs. obstacle requiring the highest climb gradient; see and avoid issues; planning departure to avoid obstacles (i.e., take off sooner); due to the long lists of obstacles, some pilots are not reading them at all; some pilots do not plan correctly; Rich said LCIO obstacles are useless for performance engineering; situational awareness function of listing these obstacles; AIS software tool in development to help group obstacles by using highest/closest to DER in each group; and displaying data on a tabular list vs. a run on list. FAA personal, Jeppesen, AOPA, Airline representatives and most attendees cited the benefits and endorsed the NBAA proposal to attempt to find a better way of disseminating this information. Consensus was that the existing lengthy lists of obstacles are cumbersome and are of questionable value to most pilots and that listing only crucial ones would be preferable. Rick supports the proposal to work on finding a better way to provide this information to the pilot and AFS-420 will take on the issue, working in conjunction with AIS on examples for ACF 16-01 (utilizing their new software for obstacle grouping) and charting specs.

**Status:** AFS-420 to report back with a status and proposals. **Item open: AFS-420**

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